ADDENDUM TO
ATTACHMENT E FOR MINERALS PROCESSING

Excerpted from the National Stone Association's
"Clean Air Management Guide for the Aggregate Industry" Section 3, entitled
"Annual Emissions Inventory Guidelines for Aggregate Plant Operations."

EMISSION POINT INFORMATION - ACTUAL
NATIONAL STONE ASSOCIATION
FACILITY ID #:
SOURCE: HAUL ROAD FUGITIVE EMISSIONS

A. HAUL ROAD EMISSION FACTOR

Haul Road Emission Factor = 2.124 x (Silt Content/12) x ((365 - Days of Rain)/365) x (No. of Wheels/4)^0.5 x (Avg. Truck Speed/30) x ((Unloaded Truck Wt. + Avg. Loaded Truck Wt.)/6)^0.7

Silt Content =	9.6 %	AP-42
Days of Rain =	115 Days	Fig. 11.2.1 - 1
No. of Wheels =	4 Wheels	
Avg. Truck Speed =	10 MPH	
Unloaded Truck Weight =	35 Tons	
Avg. Wt. of Material per Load =	35 Tons	
Avg. Loaded Truck Wt. =	70 Tons	
Haul Road Emission Factor =	2.877 Lbs PM10/VMT	

B. ANNUAL VEHICLE MILES TRAVELED (VMT)

Annual VMT = 2 x (Length of Haul Road) x (Annual Amount Hauled)/(Avg. Weight of Material per Load)

Length of Haul Road =	0.25 Miles (One Way)
Annual Amount Hauled =	676,200 Tons
Annual VMT =	9,660 VMT

C. ACTUAL EMISSIONS

Actual Emissions = (Emissions Factor x Vehicle Miles Traveled x Control Efficiency)/2000

Emissions Factor =	2.877 Lbs PM10/VMT	
Efficiency =	100 %	Water truck simulates an artificially "wet" day
Total Emissions w/o Controls =	13.895 Tons/Year	
Control Efficiency =	13.895 Tons/Year	
Actual Emissions =	0.000 Tons/Year	

EMISSION POINT INFORMATION - POTENTIAL
NATIONAL STONE ASSOCIATION
FACILITY ID #:
SOURCE: HAUL ROAD FUGITIVE EMISSIONS

A. HAUL ROAD EMISSION FACTOR

Haul Road Emission Factor = 2.124 x (Silt Content/12) x ((365 - Days of Rain)/365) x (No. of Wheels/4) 0.5 x (Avg. Truck Speed/30) x ((Unloaded Truck Wt. + Avg. Loaded Truck Wt.)/6)^0.7

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Haul Road Emission Factor =	2.877 Lbs PM10/VMT	

B. ANNUAL VEHICLE MILES TRAVELED (VMT)

Annual VMT = 2 x (Length of Haul Road) x (Annual Amount Hauled)/(Avg. Weight of Material per Load)

Length of Haul Road =	0.25 Miles (One Way)
Annual Amount Hauled =	1,350,000 Tons
Annual VMT =	19,286 VMT

C. POTENTIAL EMISSIONS

Potential Emissions = (Emissions Factor x Vehicle Miles Traveled x Control Efficiency)/2000

Emissions Factor =	2.877 Lbs PM10/VMT	
Efficiency =	100 %	Water truck simulates an artificially "wet" day
Total Emissions w/o Controls =	27.740 Tons/Year	
Control Efficiency =	27.740 Tons/Year	
Potential Emissions =	0.000 Tons/Year	

FACILITY ID #:
NATIONAL STONE ASSOCIATION
_____ QUARRY

GENERAL PROCESS AIR POLLUTION EMISSIONS - 1993

SOURCE	COMPANY ID No.	ANNUAL PRODUCTION (tons)	PM10 ** FACTOR (lbs/ton)	PM10 EMISSIONS (tons)
44" x 48" Jaw Crusher	2	574,770	0.000570	0.164
36" Conv. A	3	676,200	0.000046	0.016
6' x 16' Screen 1	4	676,200	0.000830	0.281
30" Stacker Conv.	5	5,000	0.000046	0.000
5.5' Crusher	6	473,340	0.000570	0.135
30" Conv. B	7	473,340	0.000046	0.011
30" Conv. #6	8	394,225	0.000046	0.009
30" Conv. #7	12	394,225	0.000046	0.009
8' x 20' Screen 2	13	394,225	0.000830	0.164
30" Conv.	15	290,766	0.000046	0.007
5.5' Crusher	16	290,766	0.000570	0.083
30" Conv. #8	17	290,766	0.000046	0.007
30" Conv. #4	18	281,975	0.000046	0.006
30" Conv. #5	22	50,000	0.000046	0.001
24" Conv. #9	23	43,276	0.000046	0.001
24" Conv. #10	24	43,276	0.000046	0.001
30" Conv. #11	26	43,276	0.000046	0.001
30" Conv. #12	27	43,276	0.000046	0.001
Pugmill Conv.	29	93,276	0.000046	0.002
30" Conv. #13	30	350,947	0.000046	0.008

Total Actual PM10 Emissions (Tons/Year) = 0.906 Tons
*** Total Potential PM10 Emissions (Tons/Year) = 1.808 Tons

* - The equip. associated with the wash plant produces no emissions, therefore no calculations are provided;
** - PM 10 Emission factors were obtained from the new draft AP-42 Table 8.19.2-1 using the wet suppression factors;
*** - Potential emissions were calculated as a ratio based on permit limitations (see calculations.)

EMISSION POINT INFORMATION - ACTUAL
NATIONAL STONE ASSOCIATION
FACILITY ID #:
SOURCE: OPEN STORAGE

A. LOAD IN-LOAD OUT FACTOR
Load In-Load Out Factor = 0.00224 x (Mean Wind Speed/5)^1.3/ (Moisture Content/2)^1.4

Mean Wind Speed =	8 MPH	
Moisture Content =	1.1 %	
Load In-Load Out Factor =		0.0095 #/Ton

B. WIND EROSION FACTOR
Wind Erosion Factor = 0.025 x (Silt Content/1.5) x (Storage Duration/90) x (Dry Days per Year/235) x (% of Time Wind > 12 MPH/15)

Silt Content =	1.6 %	
Storage Duration =	30 Days	AP_42
Dry Days per Year =	250 Days	Fig. 11.2.1-1
% of Time Wind > 12 MPH =	22 %	
Wind Erosion Factor =		0.0139 #/Ton

C. ACTIVITY FACTOR
Activity Factor = 0.05 x (Silt Content/1.5) x (Dry Days per Year/235) x Vehicle Activity Factor

Silt Content =	1.6 %	AP-42
Dry Days per Year =	250 Days	Fig. 11.2.1-1
Vehicle Activity Factor =	0.25	
Activity Factor =		0.0142 #/Ton

D. COMBINED ANNUAL STORAGE PILE EMISSION FACTOR
Combined Storage Pile Factor = Load In-Load Out Factor + Wind Erosion Factor + Activity Factor

Combined Storage Pile Factor =	0.0376 #/Ton

E. ACTUAL EMISSIONS
Actual Emissions = Combined Storage Pile Factor (#/Ton) x (Amt. Washed Stone x Control Efficiency) x (Amt. Other Stone x Control Efficiency)/2000 (lb/ton)

Combined Storage Pile Factor =	0.038 #/Ton	
Annual Throughput =	676,200 Tons/Yr.	
53% Washed Stone =	350,948 Tons	Control Eff. = 95%
47% Other Stone (i.e. - ABC, Rip Rap, etc.) =	325,252 Tons	Control Eff. = 80%
Actual Emissions =		1.55 Tons/Yr

EMISSION POINT INFORMATION - POTENTIAL
NATIONAL STONE ASSOCIATION
FACILITY ID #:
SOURCE: OPEN STORAGE

A. LOAD IN-LOAD OUT FACTOR
Load In-Load Out Factor = 0.00224 x (Mean Wind Speed/5)^1.3/(Moisture Content/2)^1.4

Mean Wind Speed =	8 MPH	
Moisture Content =	1.1 %	
Load In-Load Out Factor =	0.0095 #/Ton	

B. WIND EROSION FACTOR
Wind Erosion Factor = 0.025 x (Silt Content/1.5) x (Storage Duration/90) x (Dry Days per Year/235) x (% of Time Wind > 12 MPH/15)

Silt Content =	1.6 %	
Storage Duration =	30 Days	Ap-42
Dry Days per Year =	250 Days	Fig. 11.2.1-1
% of Time Wind > 12 MPH =	22 %	
Wind Erosion Factor =	0.0139 #/Ton	

C. ACTIVITY FACTOR
Activity Factor = 0.05 x (Silt Content/1.5) x (Dry Days per Year/235) x Vehicle Activity Factor

Silt Content =	1.6 %	AP-42
Dry Days per Year =	250 Days	Fig. 11.2.1-1
Vehicle Activity Factor =	0.25	
Activity Factor =	0.0142 #/Ton	

D. COMBINED ANNUAL STORAGE PILE EMISSION FACTOR
Combined Storage Pile Factor = Load In-Load Out Factor + Wind Erosion Factor + Activity Factor

Combined Storage Pile Factor =	0.0376 #/Ton

E. POTENTIAL EMISSIONS
Actual Emissions = Combined Storage Pile Factor (#/Ton) x (Amt. Washed Stone x Control Eff.) x (Amt. Other Stone x Control Eff.)/2000 (lb/ton)

Combined Storage Pile Factor =	0.038 #/Ton	
Maximum Annual Throughput =	1,350,000 Tons/Yr.	
53% Washed Stone =	700,650 Tons	Control Eff. = 95%
47% Other Stone (i.e. - ABC, Rip Rap, etc.) =	649,350 Tons	Control Eff. = 80%

Potential Emissions = 3.10 Tons/Yr.

STORAGE PILE Emission FACTOR CALCULATIONS

A. LOAD IN - LOAD OUT FACTOR

The Load In-Load Out factor is a calculated number that represents the amount of PM10 emissions that will result from the load in-load out process. The formula to calculate this factor is:

Load In-Load Out Factor = 0.00224 x (Mean Wind Speed/5)^1.3/ [Moisture Content (%)/2]^1.4

B. WIND EROSION FACTOR

The Wind Erosion Factor is a calculated number that represents the amount of PM10 released into the atmosphere from this storage pile due to wind erosion. The formula to calculate this figure is:

Wind Erosion Factor = 0.025 x Silt Content (%)/1.5]
x [Storage Duration (Days)/90]
x (Dry Days per Year/235)
x [(% of Time Wind > 12 MPH)/15]

C. ACTIVITY FACTOR

The Activity Factor is a calculated number that represents the amount of PM10 released into the atmosphere due to vehicular traffic around the storage pile. The formula to calculate this figure is:

Activity Factor = 0.05 x Silt Content (%)/1.5]
x (Dry Days per Year/235)
x (Vehicle Activity Factor)

COMBINED ANNUAL STORAGE PILE EMISSION FACTOR

Add the Load In-Load Out Factor (3-A), Wind Erosion Factor (3-B) and Activity Factor (3-C) together.